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| EXAMINER | |
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| RICE, ELISA M | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/816,229 | THOMPSON ET AL. | |
| | Examiner | Art Unit | |
| | Elisa M. Rice | 2624 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *4/1/2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

1. The following is a quotation of 37 CFR 1.75(a):

> The specification must conclude with a claim particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention or discovery.

**Claims 7, 8, 9, 10, 11, and 20** are objected to under 37 CFR 1.75(a), as failing to particularly point out and distinctly claim the subject matter which application regards as his invention or discovery.

**Regarding claim 7**, the claim reads "the at least one computer readable medium," which makes is unclear and ambiguous and seems to indicate that the same program is distributed over several computer readable mediums.

**Claims 8, 9, 10, 11, and 20**, by dependency on claim 7, are objected to on the same grounds.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**Claims 1, 2, 3, 7, 8, 9, 13, 14, and 15** are rejected under 35 U.S.C. 102(b) as being anticipated by Dianna et al. (US 6,195, 119).

**Regarding claim 1**, Dianna discloses a method of determining a size of an object, the method comprising acts of: a) capturing a digital image of a field of view that includes the object ("The video camera optically is coupled with the viewer of the optical scope or with the image of the detail and produces a video signal of the detail from the image of the detail," Dianna, abstract); b) determining the size of the field of view captured in the digital image ("The narrow field-of-view (e.g. FOV=20 degrees) results in a shallow depth-of-field (DOF).", column 7, line 48); and c) determining the size of the object based on the size of the field of view captured in the digital image ("determines the dimension of the detail based on the scaled image size," Dianna, abstract).

**Regarding claim 2**, Dianna discloses the method of claim 1, wherein the act a) further comprises an act of: capturing the digital image using a system that includes a scope to receive the image, a camera coupled to the scope to capture the image received by the scope ("The video camera optically is coupled with the viewer of the

optical scope or with the image of the detail and produces a video signal of the detail from the image of the detail," Dianna, abstract), and a measurement displacement system coupled to the scope to determine a distance of the scope from the object ("The processor converts the focus position signal into an object distance signal.", Dianna, abstract) .

**Regarding claim 3**, Dianna discloses the method of claim 2, wherein the act b) further comprises acts of: using the measurement displacement system to determine a distance of the scope from the object when the image was captured and determining a size of the field of view of the digital image ("Once the object distance (OD) is determined, the actual size of the diameter of the optical scope (D.sub.OS) can be determined", column 12, line 11). based on a calibration curve that maps distance between the scope and the object to field of view size ("stored calibration information", column 12, line 35) .

**Regarding claim 7**, Dianna discloses at least one computer readable medium encoded with instructions that ("a processor executed program", column 12, line 32, "non-volatile memory", column 12, line 35), when executed on a computer system, perform a method discussed in claim 1 above.

**Regarding claim 8**, Dianna discloses the at least one computer readable medium ("a processor executed program", column 12, line 32, "non-volatile memory", column 12, line 35) of claim 7, wherein the act a) further comprises an act of: capturing the digital image using a system that includes a scope to receive the image, a camera

coupled to the scope to capture the image received by the scope, and a measurement displacement system coupled to the scope to determine a distance of the scope from the object as discussed in claim 2 above.

**Regarding claim 9**, Dianna discloses the at least one computer readable medium ("a processor executed program", column 12, line 32, "non-volatile memory", column 12, line 35) of claim 8, wherein the act b) further comprises acts of: using the measurement displacement system to determine a distance of the scope from the object when the image was captured; and determining a size of the field of view of the digital image based on a calibration curve that maps distance between the scope and the object to field of view size as discussed in claim 3 above.

**Regarding claim 13**, Dianna discloses a computer system comprising: a display; at least one controller coupled to the display that (Fig. 10, numeral 109 and 113): captures a digital image of a field of view that includes the an object; determines the size of the field of view captured in the digital image; and determines the size of the object based on the size of the field of view capture in the digital image as dicussed in claim 1 above.

**Regarding claim 14,** Dianna discloses the computer system of claim 13, wherein the at least one controller (Fig. 10, numeral 114) captures the digital image using a system that includes a scope to receive the image, a camera coupled to the scope to capture the image received by the scope, and a measurement displacement

system coupled to the scope to determine a distance of the scope from the object as discussed in claim 2 above.

**Regarding claim 15**, Dianna discloses the computer system of claim 14, wherein the at least one controller (Fig. 10, numeral 114): uses the measurement displacement system to determine a distance of the scope from the object when the image was captured; and determines a size of the field of view of the digital image based on a calibration curve that maps distance between the scope and the object to field of view size as discussed in claim 3 above.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

**Claims 4, 5, 10, 11, 16, and 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Dianna (US 6,195, 119) and Mizukami (US 2004/0041920).

**Regarding claim 4**, while Dianna discloses the method of claim 3, Dianna does not disclose wherein the act c) further comprises acts of: determining a number of pixels in the digital image that depict the field of view; and determining a number of the pixels in the image that depict object.

Mizukami teaches wherein the act c) further comprises acts of: determining a number of pixels in the digital image that depict the field of view ("total number of pixels of the image as a whole", Mizukami, paragraph 199); and determining a number of the pixels in the image that depict object ("size of the main photographic object is given as the number of pixels", Mizukami, paragraph 199).

It would have been obvious at the time of the invention to one of ordinary skill in the art to combine the invention of Dianna with the pixel number determining method of Mizukami's invention because as the Mizukami reference states in paragraph 199 "the proportion occupied by the main photographic object in the image is easily calculated" by comparing the two and ultimately "by multiplying the size of the viewing image which has been obtained or estimated by the above-mentioned method in this invention, the size of the main photographic object in the viewing image can be easily calculated."

**Regarding claim 5**, the combination of Dianna and Mizukami disclose the method of claim 4, further comprising an act of: comparing the number of pixels in the

image of the object to the number of pixels in the digital image to determine the size of the object ("For example, in the case where the size of the main photographic object is given as the number of pixels on one side or on the radius, by comparing it with the total number of pixels of the image as a whole, the proportion occupied by the main photographic object in the image is easily calculated," Mizukami, paragraph 196).

**Regarding claim 10**, the combination of Dianna and Mizukami discloses the at least one computer readable medium ("a processor executed program", column 12, line 32, "non-volatile memory", Dianna, column 12, line 35) of claim 9, wherein the act c) further comprises acts of: determining a number of pixels in the digital image that depict the field of view; and determining a number of the pixels in the image that depict object as discussed in claim 4 above.

**Regarding claim 11**, the combination of Dianna and Mizukami discloses the at least one computer readable medium ("a processor executed program", column 12, line 32, "non-volatile memory", column 12, line 35) of claim 10, wherein the method further comprises an act of: comparing the number of pixels in the image of the object to the number of pixels in the digital image to determine the size of the object as discussed in claim 5 above.

**Regarding claim 16**, the combination of Dianna and Mizukami discloses the computer system of claim 15, wherein the at least one controller (Fig. 10, numeral 114): determines a number of pixels in the digital image that depict the field of view; and

determines a number of the pixels in the image that depict object as discussed in claim 4 above.

**Regarding claim 17**, the combination of Dianna and Mizukami discloses the computer system of claim 16, wherein the at least one controller (Fig. 10, numeral 114): compares the number of pixels in the image of the object to the number of pixels in the digital image to determine the size of the object.

**Claims 6, 12, and 18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Dianna (US 6,195, 119) and Nishioka (US 4,621, 284).

**Regarding claim 6**, while Dianna discloses the method of claim 3, Dianna does not disclose wherein the scope includes a first light source with light in a first spectrum that illuminates the field of view, wherein the measurement displacement system includes a second light source with light in a second spectrum, wherein the measurement displacement system determines the distance by measuring light from the second source that is reflected off the object and received at a sensor, and wherein the method further comprises an act of: filtering the light from the first light source of the scope so that light from the first light source does not reach the sensor and interfere with the measurement by the measurement displacement system.

Nishioka teaches wherein the scope includes a first light source with light in a first spectrum that illuminates the field of view, wherein the measurement displacement

system includes a second light source with light in a second spectrum, wherein the measurement displacement system determines the distance by measuring light from the second source that is reflected off the object and received at a sensor, and wherein the method further comprises an act of: filtering the light from the first light source of the scope so that light from the first light source does not reach the sensor and interfere with the measurement by the measurement displacement system ("consisting of a red light transmitting portion 8'a, green light transmitting portion 8'b, blue light transmitting portion 8'c and infrared light transmitting portion 8'd as shown in FIG. 8 is provided instead of the rotary filter 8 in the embodiment in FIG. 6, an infrared ray cutting filter 37 is provided between the observing illumination light source 2 and light guide 3 and the measuring illumination light source 10 is formed as a light source emitting an infrared light.", Nishioka, column 4, line 58)

It would have been obvious at the time of the invention to one of ordinary skill in the art to modify the measuring endoscope system of Dianna to include light sources of different spectrums and a filtering system on the illuminating light source as taught by Nishioka because as Nishioka states in column 4, line 67 "according to this formation, the illuminating light sources 2 and 10 may be always emitting lights."

**Regarding claim 12**, the combination of Dianna and Nishioka discloses the at least one computer readable medium ("a processor executed program", column 12, line 32, "non-volatile memory", column 12, line 35) of claim 9, wherein the scope includes a

first light source with light in a first spectrum that illuminates the field of view, wherein the measurement displacement system includes a second light source with light in a second spectrum, wherein the measurement displacement system determines the distance by measuring light from the second source that is reflected off the object and received at a sensor, and wherein the method further comprises an act of: filtering the light from the first light source of the scope so that light from the first light source does not reach the sensor and interfere with the measurement by the measurement displacement system as discussed in claim 6 above.

**Regarding claim 18**, the combination of Dianna and Nishioka discloses the computer system (Fig. 10, numeral 114) of claim 15, wherein the scope includes a first light source with light in a first spectrum that illuminates the field of view, wherein the measurement displacement system includes a second light source with light in a second spectrum, wherein the measurement displacement system determines the distance by measuring light from the second source that is reflected off the object and received at a sensor, and wherein the system further includes a filter that filters the light from the first light source of the scope so that light from the first light source does not reach the sensor and interfere with the measurement by the measurement displacement system.

**Claims 19, 20, and 21** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Dianna et al. (US 6,195, 119) and Morris et al. (US 4,207,594).

**Regarding claim 19**, while Dianna discloses the method of claim 1, Dianna does not disclose wherein the object is at least a portion of an aircraft component, wherein the act a) further comprises an act of capturing a digital image of a field of view that includes the at least a portion of the aircraft component, and wherein the act c) further comprises determining the size of the at least a portion of the aircraft component based on the size of the field of view captured in the digital image.

Morris teaches wherein the act a) further comprises an act of capturing a digital image of a field of view that includes the at least a portion of the aircraft component, and wherein the act c) further comprises determining the size of the at least a portion of the aircraft component based on the size of the field of view captured in the digital image ("The invention utilizes conventional and known equipment, with some modification, to present a new method for indirectly measuring the size of defects in machines, engines and other devices. Utilizing a rigid borescope probe, modified to include a scale on the probe barrel, it becomes possible to measure changes in the probe insertion depth. This scale combined with the photographic capability of the borescope allows the development of a method for taking indirect measurements with reasonable accuracy. The borescope is manipulated in manner that will determine the true dimension of the field of view. Cross hairs are generated on the video monitor and moved to the extremes of the field of view and their position noted. The cross hairs are then repositioned, bracketing the object (defect) to be measured and this position noted. A ratio is established between the values noted for the positions of the cross hair and this ratio is used to multiply the true field of view.", Morris, column 1, line 29, "For example,

the top of a defect in a turbine blade is positioned first at the top of scope field of view and the probe penetration dimension is recorded. The defect top is then positioned at the bottom of the scope field of view and the probe penetration dimension recorded. The latter dimension is subtracted from the former dimension and the result is the field of view", Morris, column 2, line 34)

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the invention of Dianna to inspect aircraft components as done in the Morris reference because as Morris states in column 1, line 15: "since the introduction of jet engines to aviation, damage to the compressor turbine blades by either foreign or domestic objects has been a big problem. Once a blade or blades other than in the first or last stages have been damaged, the engine must be torn down in order to measure the damage. In the more recent engines, apertures have been designed into the engines in critical areas so that with the aid of a borescope, the blades may be viewed optically and photographed with the aid of photographic attachments to the borescope."

**Regarding claim 20**, the combination of Dianna and Morris discloses the at least one computer readable ("a processor executed program", column 12, line 32, "non-volatile memory", column 12, line 35) of claim 7, wherein the object is at least a portion of an aircraft component, wherein the act a) further comprises an act of capturing a digital image of a field of view that includes the at least a portion of the aircraft component, and wherein the act c) further comprises determining the size of the at least a portion of the

aircraft component based on the size of the field of view captured in the digital image as discussed in claim 19 above.

**Regarding claim 21**, the combination of Dianna and Morris discloses the computer system (Fig. 10, numeral 114) of claim 13, wherein the object is at least a portion of an aircraft component, and wherein the at least one controller captures a digital image of a field of view that includes the at least a portion of the aircraft component and determines the size of the at least a portion of the aircraft component based on the size of the field of view captured in the digital image as discussed in claim 20 above.

## *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elisa M. Rice whose telephone number is (571)270-1580. The examiner can normally be reached on 8:00a.m.-5:30p.m. EST Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian P. Werner can be reached on (571)272-7401. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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